

# Montana Pesticide Bulletin



**MONTANA**  
STATE UNIVERSITY

EXTENSION

April 2008

## High Pesticide Concentrations in Glacier National Park

*By Cecil Tharp, MSU Pesticide Education Specialist*

According to a 6-year airborne contaminant study (Airborne Contaminants Assessment Project), some chemicals were found to exceed health thresholds in eight national parks. This investigation found high levels of DDT and dieldrin at Glacier National Park, Mont. (Figure 1). Concentrations of DDT in fish exceeded the human risk threshold for subsistence fishermen (adults eating 19 meals of fish per month) as well as the bird eating threshold at Oldman Lake in Glacier National Park, Mont. Dieldrin concentrations also exceeded the health threshold for those eating 2.3 meals of fish per month. Some cutthroat trout in Glacier exhibited intersex (i.e., male and female reproductive structures) characteristics that are often correlated with high dieldrin or DDT concentrations which mimic the hormone estrogen. Further studies are needed to verify if these effects are correlated with high chemical concentrations in Glacier National Park.

correlated in reductions of some bird populations including the American bald eagle. Further study would classify DDT as a persistent organic pollutant that is immobile in soils and degrades slowly in the environment, while being magnified through the food chain. Use of DDT has continued in some countries around the world.

Dieldrin, a chlorinated hydrocarbon, was developed in the 1940s and widely used as an alternative to DDT from the 1950s to 1970 in such formulations as Alvit, Dieldrix, Octalox, Quintox, and Red Shield. The EPA canceled all uses of dieldrin in 1970, however in 1972, the EPA approved uses of this chemical in termite control until 1987. Dieldrin breaks down very slowly in the environment while accumulating in fat tissues. This chemical has been linked to health problems such as Parkinson's, Breast Cancer, and immune system damage.

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DDT (Dichloro-Diphenyl-Trichloroethane) has been used for insect control since 1939 until the EPA delisted most uses in 1972. This product was responsible for saving millions of lives from insect vectored diseases in addition to protecting agricultural crops from significant insect related yield losses. DDT was later

NATIONAL PARK SERVICE



Figure 1



# WHAT KIND OF “GOPHERS” ARE IN THE PASTURE?

By Roy Fenster, Associate Wildlife Specialist, MSU

Many Montana farmers and ranchers find themselves dealing with ground squirrels or prairie dogs each spring, and the potentially large amounts of damage they can cause to crops and livestock forage. Although these rodents are often commonly referred to as “gophers”, they are in fact not the same animal as the northern pocket gopher, Montana’s most common actual gopher. Registered pesticides and application rules are very different for ground squirrels, prairie dogs, and pocket gophers. Proper identification of the pest in question is extremely important for choosing the correct pesticide, application procedure, and following label directions.

## Pocket Gophers

Pocket gophers are quite distinguishable from both ground squirrels and prairie dogs. There are two species of pocket gophers in Montana, the northern pocket gopher (*Thomomys talpoides*) and the Idaho pocket gopher (*Thomomys idahoensis*). While the northern variety is found nearly statewide, the Idaho pocket gopher has only been found in Beaverhead and Ravalli counties. The two are extremely similar and very difficult to tell apart.

Pocket gophers are much smaller than prairie dogs or ground squirrels, being only about six inches long and weighing about a fourth of a pound. Their coats are a dark, reddish brown, and they have very small eyes and ears. Pocket gophers have exposed front teeth and long digging claws on the front feet, and are adapted to spending most of their lives underground in an extensive burrow system. In fact, they are rarely seen above ground, and the most common evidence they exist is the mounds of excavated dirt they push up to the surface from the burrow. A pocket gopher mound will be a fan shaped pile of loose dirt with no tunnel or hole

emerging from it, while mounds made by prairie dogs and ground squirrels generally have a visible hole or tunnel exposed.

## Prairie Dogs

Two species of prairie dogs are found in Montana. The black-tailed prairie dog (*Cynomys ludovicianus*) is widely spread across the plains of Montana, primarily east of the Continental Divide. Closely related is the white-tailed prairie dog (*Cynomys leucurus*), whose distribution in Montana is limited to certain parts of Carbon County. The two are very similar, with the biggest distinction being the color on the tip of the tail. As the names imply, white-tailed prairie dogs have a white tip on their tail, while the black-tailed prairie dogs have a tail with a black tip.



Figure 2

Prairie dogs (Figure 2) are a fairly short and stocky animal, approximately 12 inches tall when standing up, and weighing in at about two pounds. They are generally cinnamon colored, and live in colonies or towns that can cover several acres. Prairie dogs prefer short vegetation so they can see their surroundings, and will clip the vegetation around their mounds nearly to the ground. Their mounds are very distinct, generally round, and humped up several inches above the surrounding area, with an exposed tunnel. Unlike

ground squirrels and white-tailed prairie dogs, black-tailed prairie dogs do not hibernate in the winter. Although they may remain underground during inclement weather, they can often be seen above ground during winter.

## Ground Squirrels

There are actually six different recognized species of ground squirrels in Montana, four of which consistently cause crop or forage damage and can be very difficult to tell apart under field conditions. These include the Uinta ground squirrel (*Spermophilus armatus*) and the Wyoming ground squirrel (*Spermophilus elegans*), which are found primarily in the southwest corner of Montana. More commonly found across much of western Montana is the Columbian ground squirrel (*Spermophilus columbianus*), and east of the Continental Divide, the ground squirrel most likely to be digging holes in the pasture is the Richardson’s ground squirrel (*Spermophilus richardsonii*). However, the specific species of ground squirrel being controlled is not as important to know as the fact that it is indeed a ground squirrel, not a prairie dog or pocket gopher.

Each of these four ground squirrels is medium sized, about 8-10 inches tall when standing, and weigh roughly one pound. They are light tan to cinnamon colored, and do not have a distinctively tipped tail like prairie dogs. They often live in areas with short vegetation, but can also be found in alfalfa fields and other areas with taller plants. The mounds are generally not as distinctive or as humped as prairie dogs, but do have an exposed tunnel. These animals are only active during the day, and hibernate in the winter. Males will begin to become visible in early March each spring, and the last animals are usually hibernating by late September.

(cont from "Gophers" on pg 2)

## Control

Crop rotation, natural predators, shooting, and trapping can all provide some level of control for these rodents. However, proper use of pesticides will generally have the best results, especially if combined with some form of alternative follow up control. All control methods, particularly the use of poisoned grain baits, are most effective in the early spring, before green-up, when animals are actively feeding but have not yet produced any offspring.

There are many different brands and types of pesticides available, including general and restricted use, each with their own benefits and drawbacks. Make sure the pesticide you use is registered for the rodent you are controlling. For example, strychnine grain baits are only registered for use on pocket gophers, and are not allowed for control of prairie dogs and ground squirrels. Ground squirrels can be controlled using anticoagulant grain baits in bait stations, zinc phosphide baits, and burrow fumigants. For prairie dog control, anticoagulant treated grain baits and bait stations are not allowed, and zinc phosphide treated grains are the only registered grain bait.

Be sure to read and follow all labels closely when using pesticides to control rodents. Proper identification of the rodent is the first step for control. Developing an integrated plan using appropriate control methods will help ensure that time and money are not wasted, and that the control is effective. Usually, applying only one type of treatment will not yield effective control, and some type of follow-up will be necessary. Consult with your local County Extension Agent for additional advice. Or, for more information contact Roy Fenster, Associate MSU Extension Wildlife Specialist.

# New Department of Homeland Security Requirements

By Cecil Tharp, Pesticide Education Specialist

The Department of Homeland Security (DHS) has been granted authority to regulate chemical facilities that present high levels of security risks according to section 550 of the DHS Appropriations Act of 2007. DHS issued the Chemical Facilities Anti-Terrorism Standards (CFATS) which mandates all agri-businesses and farm operations which exceed threshold levels of critical chemicals of interest to register with DHS by January 22, 2008. These chemicals and their corresponding thresholds are listed in Appendix A of the Chemical Facility Anti-Terrorism Standards, DHS Chemicals of Interest Sheets ([http://www.agriculture.state.pa.us/agriculture/lib/agriculture/pdfdocs/ASINS\\_Terrorism\\_Bro\\_LO.PDF](http://www.agriculture.state.pa.us/agriculture/lib/agriculture/pdfdocs/ASINS_Terrorism_Bro_LO.PDF)). Many of these chemicals are present in Montana agricultural production (Table 1). The deadline for complying was initially January 22 for either agri-businesses or farms, however a supplement to this initial order has changed the requirements of this mandate for some operations.

According to the DHS supplemental titled "Notice to Agricultural Facilities About Requirement To Complete Chemical Security Assessment Tool Top-Screen" (docket #: DHS-2006-0073),

the deadline for submitting the Top-Screen has been extended indefinitely for agricultural operations involved in the preparation of treatment or application to crops, feed, land, livestock, or other areas of an agricultural production facility. This applies to farms, ranches, poultry, dairy, and equine facilities, turf-grass growers, golf courses, nurseries, floricultural operations, and public and private parks. These facilities do not have to comply to a Top-Screen assessment or apply with DHS.

## Other Agri-businesses

Any other agri-business not listed under the umbrella of docket # DHS-2006-0073 is still subject to the January 22 deadline. This applies mainly to chemical manufacturers, chemical distribution facilities, and commercial chemical application services. Failure to comply could result in civil penalties of up to \$25,000 per day or closure of the operation.

For further information, contact: The U.S. Department of Homeland Security (Chemical Facility Anti-Terrorism Standards; (866) 323-2957).

**Table 1. A list of common Montana agricultural chemicals listed in the DHS Chemicals of Interest Sheet and their corresponding thresholds.**

Chemical	DHS Threshold Level	Details
Chlorine	2,500 pounds	Bulk not bagged
Chlorine	500 pounds	Bagged or packaged
Anhydrous ammonia	10,000 pounds	4 typical pull behind tanks
Ammonium nitrate	2,000 pounds	Bagged
Potassium nitrate	400 pounds	Bagged
Sodium nitrate	400 pounds	Bagged



# Groundwater and Surface Water Monitoring for Pesticides and Nitrate in Gallatin Valley

By Rick Mulder, Hydrologist; and Amy Bamber, Program Manager,  
Montana Department of Agriculture

Montana Department of Agriculture's (MDA) Ground Water Protection Program samples ground and surface water across the state to determine the presence of pesticides and fertilizers. The program has a permanent network of 42 monitoring wells. In addition, investigative and special projects are conducted in vulnerable areas, watersheds, and urban environments.

During the summer of 2006, the MDA conducted a monitoring project in the Gallatin Valley. We collected samples from 26 wells and three streams, once in early summer and once in late summer. Our laboratory analyzed them for 102 pesticide compounds as well as nitrate and nitrite. Sampling sites were located in areas with agricultural, urban, residential, and suburban land uses.

All of the pesticide detections were at very low concentrations. Human health drinking water standards exist for most pesticides. Some pesticides also have aquatic life standards. These standards let us know when detections should be of concern for human or aquatic life. The pesticide detections in this study were at levels far below the standard at which to be concerned.

Over half of the groundwater sites had at least one pesticide detected, most at extremely low levels. The most commonly detected pesticide in groundwater was atrazine and one of its degradates, or breakdown products. Atrazine is currently used predominantly in corn and sorghum, but in the past was widely used in both agriculture and landscapes. The next most commonly detected pesticide was imazamethabenz and one of its degradates. This is an herbicide used in small grains. Other pesticides that were detected included two soil sterilants, some widely used herbicides, one fungicide and one insecticide.

All three surface water sites had pesticide detections also. The most commonly detected pesticide in surface water samples was 2,4-D. Other pesticides detected included three soil sterilants and three herbicides.

The presence of nitrate may be due to fertilizer, animal waste (including septic effluent), or it may be naturally occurring. Nitrate was detected in 76 percent of the groundwater samples. None of the nitrate concentrations exceeded the human health drinking water standard of 10 parts per million and only 2 of the samples from a single site exceeded 50 percent of the standard. Nitrate was not detected in any of the surface water samples.



MONTANA DEPARTMENT OF AGRICULTURE

By conducting these special monitoring projects, MDA is able to better understand the impact of pesticide and fertilizer use on our water resources. Please visit our website, <http://agr.mt.gov/pestfert/groundWater.asp>, for more specific information on this report and to see what else we are doing.

(cont from *High Pesticide Concentrations in Glacier National Park* on pg 1)



*Hidden Lake at Glacier National Park.*

High levels of select chemical contaminants were not limited to Glacier National Park but also were found in Mount Rainier, Olympic, Rocky Mountain, Sequoia and Kings Canyon, Denali, Gates of the Arctic, and Noatak National Parks. The extent of these chemicals' effect on wildlife is still unknown, but the risk to people is believed to be low. Most Montana fishermen are not likely to eat contaminated fish at levels required to reach human risk thresholds.

Weather patterns from Europe and Asia may be carrying pesticide residuals to our state. Current uses of these chemicals do exist in other countries which may facilitate its delivery into the atmosphere. Further research is needed to ascertain the delivery mechanism of these chemicals onto our natural resources.

For additional information contact Dr. Dixon Landers at (541) 754-4427, or see the National Park Service news release online at <http://home.nps.gov/applications/release/Detail.cfm?ID=784>.

# Long Term Pesticide Exposure on the Farm: The Agricultural Health Study

By Cecil Tharp, Pesticide Education Specialist

Pesticides are a valuable tool for Montana farmers and ranchers to manage weeds, insects, plant pathogens, predators, and rodents. Many applicators have used pesticides throughout their lifetime, learning which pesticides are 'dangerous' and which ones are 'safe'. This perspective is often biased towards the acute (short term) toxicity of a pesticide and may not consider the chronic (long term) consequences of unsafe practices. This may result in a failure to follow the product label which results in:

1. not wearing personal protective equipment
2. improperly stored pesticides
3. inadequate cleaning of spray clothes, equipment, or the applicator following a spray application.

Repeated exposures over long durations of time (chronic) may cause health problems that are not readily visible. The Agricultural Health Study was initiated in 1993 to determine the long term consequences of using various pesticides and agricultural practices. This investigation, which assessed over 90,000 certified pesticide applicators and their spouses, found a relationship between the use of certain pesticides and prostate cancer, wheezing, retinal degeneration, and female reproductive health.

## Prostate Cancer

This study found applicators over age 50 who used methyl bromide fumigants, aldrin, chlordane, DDT, dieldrin, endrin, hexachlor, toxophene, to be associated with higher rates of prostate cancer. Applicators who had a family history of prostate cancer who used chlorpyrifos (Lorsban®), coumaphos (Co-Ral), fonofos (Dyfonate®), and permethrin (with animal uses) also were associated with higher rates of prostate cancer.

## Wheezing

Wheezing was associated with private applicators who used many organophosphates including parathion, malathion, and chlorpyrifos. Chlorpyrifos was *strongly* associated with wheezing in applicators using chlorpyrifos for at least 20 days per year.

## Retinal Degeneration

Applicators and applicator's wives who used fungicides including benomyl, captan, chlorothanil, copper ammonia carbonate, ferbam, maneb, metaxyl, PCNB, and sulfur were associated with degeneration of the retina. These findings suggest that exposure to many fungicides may increase the risk of retinal degeneration.

## Female Reproductive Health

Women aged 21 – 40 who use pesticides have longer menstrual cycles and an increased probability of missing periods. This was based on testing more than 3,100 women living on farms.

## Conclusion

Chronic toxicity testing of pesticides is currently required by law, and the results are used to establish several protective thresholds for both applicators and the general public. Chronic health findings are also reported in warning statements on the product label. Some argue that current chronic testing procedures are unsatisfactory because they consider only active ingredients of pesticides. This argument maintains that the testing of inert and active ingredients is needed to adequately assess chronic toxicity in humans.

The results from this study have also drawn debate from within the scientific community. This study relies

primarily on the memory of participants to determine their exposures. Hind-sight investigations based on surveys are prone to personal bias as memory recall is subjective and may influence the conclusions that are drawn from this investigation. An association does not necessarily imply cause and effect. Further studies are needed to implicate whether many of these associations are incidental or causal in the increased incidence of these health problems.

Pesticides are an invaluable tool for agriculture that must continue in supporting our planets rising populations, fighting pest outbreaks, and minimizing insect vectored diseases. The take home message should be to minimize pesticide exposure by wearing proper personal protective equipment, cleaning pesticide contaminated clothing, and using pesticides only when necessary. Reading and following the product label will help minimize any detrimental effects that may occur years later through long term misuse of pesticides.

For further information on these findings see the Agricultural Health Study online (<http://aghealth.nci.nih.gov/>) or contact the MSU PSEP office at (406) 994-5067.



# The IR-4 Project in Montana

By Mary Burrows,  
Extension Plant Pathology Specialist

The IR-4 Project is a government project that facilitates pesticide registrations on minor crops. Since the primary crop plant in Montana is wheat, which is not a minor crop, you might wonder why Montana is involved in this program. Well, there are a number of minor crops in Montana, and some are useful rotational crops for wheat. Examples of minor crops in Montana include camelina, mustards, safflower, cherries, seed potatoes, malt barley, mint, nursery and floral crops, etc. This program can also facilitate pesticide registrations for minor uses on major crops. An example is if we needed an insecticide that was not labeled on wheat to control the Haanchan mealy bug, which Cecil Tharp wrote about in the last edition of the 'Montana Pesticide Bulletin.'

IR-4 receives requests for assistance from growers, commodity groups, and research and extension personnel. In responding to these grass-roots needs, IR-4 leads the coordination and focus of generating data to support the regulatory clearances of crop protection chemical and biological products for food crops through the Environmental Protection Agency (EPA). IR-4 also coordinates efforts to generate efficacy and crop safety data to support chemical and biological crop protection products for ornamental horticulture crops. To accomplish this, IR-4 has developed a 4-step approach: 1. Research prioritization 2. Research planning 3. Research implementation and 4. Data submission and approval. More details about this process can be found on the IR-4 website, [www.ir4.rutgers.edu](http://www.ir4.rutgers.edu).

One way IR-4 has helped Montana is by requesting the registration of Poast (sethoxydim) for weed control in camelina. The EPA is currently

## Pesticide Disposal Program: Overview and Future

By Levi Ostberg, Agricultural Specialist, Montana Department of Agriculture

### Pesticides Collected in 2007

The 2007 Pesticide Disposal Program disposed of 17,577 pounds of old, unwanted and unusable pesticides from 81 businesses and individuals in the Glasgow, Sidney, Glendive, Miles City, and Billings areas. A dealer contributed the largest volume in Billings, totaling 5,780 pounds.

The pesticide products collected that have not been registered in many years include, mercury seed treat, endrin, dieldrin, and DDT. Several individuals brought in decades old products for disposal, some with no idea what they had. Most of these products were found when cleaning out family property or after purchasing property or buildings.

The 14-year-old program is supported through collection charges and fees on pesticide application licenses. During its fourteen year history, the Pesticide Disposal Program has collected 289,666 pounds of pesticides.

In September 2008, the program will hold collections in Western Montana in Kalispell, Missoula, Butte, and Bozeman. While exact locations and dates are not yet known, updates will be posted on the department disposal Web page at <http://www.agr.mt.gov/pestfert/disposal.asp>.

reviewing this request, and will have a decision by September, 2008 at the latest. This IR-4 Project petition was coordinated with the Montana Department of Agriculture, Montana State University, chemical company BASF, commodity groups and the EPA.

### Pesticide Plastic Recycling

The Department of Agriculture, along with the Department of Environmental Quality, hosted several Pesticide Plastic Recycling events in 2007. Collections were held in Great Falls, Butte, and multiple sites along Highway 2, resulting in 19,450 pounds of pesticide plastic being collected for recycling. Prior to recycling, the plastic was triple-rinsed, labels were taken off, and all metal and lids were removed. All of the plastic was inspected by MDA staff either prior to the day or during the event to ensure that it was properly prepared and that it was safe for recycling. Some of this plastic was shipped to Washington to be recycled into drain field pipe and other industrial uses, while the remainder was collected by an Idaho company for their own use. Plans are being made for more collection events in the future. These events must be coordinated collections. If you are interested in participating in a collection, contact your local weed districts, chemical dealers or your MDA district specialist to find out more specifics.

For more information contact: Levi Ostberg, Montana Department of Agriculture, (406) 444-5400. examples of past agendas.

Estimates of potential economic loss, without the use of IR-4 based section 18s in Montana from 1998-2005 is \$165 million. Please contact Mary Burrows at (406) 994-7766, or [mburrows@montana.edu](mailto:mburrows@montana.edu) if you have any questions about IR-4.



# Comments and/or Questions from the Public

By Cecil Tharp, Pesticide Education Specialist, MSU

**Q: STANFORD, Mont.** I am experiencing the initial stages of Parkinson's disease and have applied pesticides my entire life. Is my Parkinson's disease from pesticide use?

**A:** A pesticide's toxicity varies by the exact pesticide used and exposure levels associated. Chronic exposure levels vary by number of exposures over a lifetime, dose of each exposure, duration of each exposure, and the genetic background of the applicator to the disease in question. This makes it difficult to answer such a broad question. The agricultural health study (based on surveys) suggests exposure to certain pesticides may increase Parkinson's disease risk. More research is needed to verify the exact dosages and pesticides that would contribute to this elevated risk. An applicator should always wear proper personal protective equipment and read the product label to minimize any acute or chronic safety risks.

**Q: BILLINGS, Mont.** I was qualified for private applicator recertification at the end of my certification cycle but did not receive a new license. Is this a problem?

**A:** An applicator should be vigilant with the status of their certification. A private applicator is considered qualified for renewal if they accumulate six or more re-

certification credits prior to their regional recertification deadline. The Montana Department of Agriculture should send a bill to all qualified individuals asking them to pay the \$50 renewal fee prior to January 1 of the recertification year. If this fee is not sent to MDA they will not be recertified. If you have paid your fee and did not receive your new license by February 1 of the recertification year, contact the MDA at (406) 444-5400. If you have qualified for recertification but did not receive a payment notice from MDA, contact your local extension office.

**Q: ENNIS, Mont.** I work for a local mine and my supervisor wants me to spray weeds with restricted use pesticides. Can I use a private applicator license?

**A:** No. According to the Federal Insecticide, Fungicide, and Rodenticide Act, a private applicator is a certified applicator that uses or supervises the use of any pesticide which is classified as restricted use for purposes of producing an agricultural commodity. The mine is not producing an agricultural commodity. Montana Department of Agriculture has created a non-commercial category for this special situation. For more information on commercial/non-commercial certification contact the MDA at (406) 444-5400.

## Do you have a comment or question for future issues of the Montana Pesticide Bulletin?

If you do, send to:

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Web: [www.pesticides.montana.edu](http://www.pesticides.montana.edu)

-OR-

Janet Kirkland  
Certification & Training Officer  
Montana Department of Agriculture  
Agricultural Sciences Division  
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Web: <http://agr.mt.gov/licensing/commercialapp.asp>



# Montana Pesticide Bulletin

## MSU Pesticide Safety and Education Program TRAINING & REFERENCE MATERIALS

### Personal Information

Name: \_\_\_\_\_  
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INITIAL PRIVATE APPLICATOR CERTIFICATION - (STUDY MATERIALS)		
Montana Private Pesticide Certification Handbook EPA How to Comply with the WPS (CD) EPA How to Comply with the WPS (Book) MSU Pesticide Recordkeeping Booklet USDA Recordkeeping Manual for Private App Montana Pesticide Bulletin – 2 year subscription		
Complete PSEP Training Packet	Total Cost = \$15.00	Check box if needed

PESTICIDE SAFETY & EDUCATION REFERENCE MATERIALS		
Reference Materials	Cost	Total
Montana Private Pesticide Certification Handbook	\$9.00	
EPA How to Comply with the WPS (CD)	\$1.00	
EPA How to Comply with the WPS (Book)	\$3.00	
MSU Pesticide Recordkeeping Booklet	\$1.50	
USDA Recordkeeping Manual for Private App	\$1.50	
Montana Pesticide Bulletin – 2 year subscription	\$8.00	
TIPS for Fighting Weeds on Small Acreages in Montana	\$3.00	
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